

Our Reference: 200308817-1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John R. Moffatt et al.
Serial Number: 10/672,486
Filing Date: September 25, 2003
Examiner/Art Group Unit: Betelhem Shewareged
Title: PROTECTION OF PRINTED IMAGES FROM
GASFADE

DECLARATION PURSUANT TO 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Matthew Thornberry, hereby declare the following:

1. I am a co-inventor of the above-identified application.
2. I am a citizen of the USA residing at Corvallis, Oregon.
3. I received a B.S. degree in chemistry from James Madison

University and a Ph.D. degree in inorganic chemistry from Virginia Tech
University.

4. I joined Hewlett-Packard Company in 2001 as an Ink
Chemist.

5. I have read Schleicher et al. (U.S. Patent No. 5,837,036).
Specifically, Schleicher, in column 3, lines 30-38, discusses applying a solution of poly(phenylene sulfide)(PPS) or poly(2,6-dimethylphenylene oxide) to a support material. Such a solution would, to a substantial extent, penetrate into the support material, especially if such support material were formed from paper or other materials commonly used for an inkjet print medium.

6. In contrast, since PPS has a high melting point (T_m), and is relatively insoluble, a layer incorporating PPS is applied to the print medium by heating the PPS to a temperature above approximately 285°C and coating the melted PPS on the print medium according to embodiments of our disclosure. (See, e.g., 10/672,486 application as filed at page 10, lines 11-14.) When a topmost layer of PPS is applied to the medium, in other than a solution form, it results in a discrete layer, which penetrates little, if at all, into the medium. (See, e.g., 10/672,486 application as filed at page 7, lines 23-29). This results in a stronger, more long-lasting anti-ozone protective effect for the medium.

7. The physical basis of the difference between the PPS solution used in Schleicher and the PPS discrete layer used in the present application can be explained as follows. When the temperature of PPS is raised above 285°C, the polymer will behave as a viscous fluid as long as the temperature is above the PPS melting point (T_m). When the viscous PPS fluid is subsequently coated onto a print medium, a discrete surface layer of PPS is formed. Initially, the PPS coating will not rapidly penetrate into the medium because polymers behave as viscous fluids at temperatures above their melting points. Next, upon contacting the print medium, the viscous PPS fluid will rapidly cool to below 285°C and cease to flow because the temperature is now below the polymer melting point. This method of applying a PPS coating is desirable in that the ink receiving layers of the print medium remain unaltered since the polymer coating is deposited on the topmost surface of the print medium. A solution coating as described by Schleicher is incapable of forming a discrete surface polymer coating since the polymer solutions described by Schleicher will penetrate into the print medium, thus diffusely depositing the polymer throughout the medium and not as a discrete surface layer. Furthermore, the application of a polymer solution to a print medium changes the surface chemistry and porosity of the ink receiving layers within the print medium, since both the polymer and the solvent used to dissolve the polymer will have penetrated throughout the print medium. Such changes to the surface chemistry and porosity of the print

medium can negatively impact printed image quality and image resistance to gases such as ozone.

8. In conclusion, I believe, as explained above, that one skilled in the art would not find taught or suggested in Schleicher a topmost, discrete PPS layer, having been applied in other than a solution form, on an inkjet ink medium, as is disclosed in the present application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and, that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


Matthew Thornberry

6/2/2009
Date